

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Device for Dispensing Small Objects

- We, JEAN AUFFRET, a French Citizen, of 20, rue Chapon, Paris, France, and ETABLISSEMENTS BOHIN, a French body corporate, of 72, rue Rambuteau, Paris, France, do hereby  
5 declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- 10 The object of this invention is to provide a device for dispensing small objects, such as pharmaceutical pills.
- According to the invention such a device comprises an elastically deformable container,  
15 an end wall of which is provided with an aperture adapted to be widened by lateral pressure exerted on said container in the vicinity of the said aperture, wherein the said container is provided with a receptacle for receiving the  
20 dispensed objects, said receptacle being adjacent to the said end wall and having a laterally disposed opening. The dispensed objects leave the container either under the influence of gravity or by mechanical means, for example a spring or the like.
- 25 Various arrangements of the dispensing device are envisaged for its many possible applications.
- The following description with reference to  
30 the accompanying drawings, given by way of example, will make it understood how the invention may be put into practice, the features which appear both from the drawing and the text forming, of course, part of the said  
35 invention.
- In the drawings:—
- Figures 1 and 2 are a sectional view and an end view of a part of the apertured container of a dispensing device in accordance with the  
40 invention;
- Figures 3 and 4 are views similar to Figures 1 and 2, respectively, showing the container aperture opened to dispense objects;
- Figures 5 and 6 are perspective views of a  
first embodiment of a dispensing device in 45 accordance with the invention;
- Figures 7 to 10 are perspective views of a telescopic dispensing device;
- Figure 11 is a sectional view of a modified dispensing device in its closed condition: 50
- Figure 12 shows the device of Figure 11 in its open condition;
- Figures 13 to 15 are detailed sectional views of parts of the device of Figures 11 and 12;
- Figures 16 and 17 show the application of 55 the invention to the removable cover of a bottle;
- Figures 18 and 19 show the case and the sliding cover of an automatic dispensing device, which causes the object to be dispensed 60 to appear in the receptacle simply by pulling the cover, and
- Figures 20 to 22 show the mechanism of the device of Figures 18 and 19.
- Referring to Figures 1 to 4, the reference 65 numeral A (Figures 1 and 3) designates part of a cylindrical container which is closed at its lower end by a partition B, the latter being shown in plan in Figures 2 and 4. The partition B and the container A may be made in 70 a single piece or they may be constructed so that they can be joined together. The container A is supposed to be vertical so that the objects C (which are here shown as spherical but which may be of other shapes) have a tendency to gravitate towards the bottom. 75
- The partition B is pierced by a hole D which is shown centrally disposed, but this is not absolutely necessary as will become apparent hereinafter. Naturally this hole D is smaller 80 than the spherical objects C so that the latter cannot escape.
- The partition B is slit at E along a diameter on both sides of the hole D. This particular positioning of the slit E is not essential, but 85 has been chosen in the present case to facilitate an understanding of the functioning of the device.

[Pri]

Pp

In Figure 2 the slit E is closed and the hole D is circular. The tube A and the partition B are made of an elastically deformable material. If now two oppositely directed forces F and F' (see Figures 3 and 4) are applied at each side of the partition B, gripping the partition like a pair of tongs, in the extension of and at the level of the slit E, the partition B assumes a more or less elliptical shape, its centre bulging more than its periphery in the region where the latter is joined to the tube A and is obliged to remain in the same plane. This bulging can be made to take place always in the same desired direction, for example by providing the partition B with ribs on one side only so that the bulging takes place in the direction of least resistance. In bulging, the diameter  $a-a'$  of the partition lying perpendicular to the slit E extends, while the diameter  $b-b'$ , where the slit is found, decreases. The lips of the slit separate to increase the size of the hole D and the objects C can then escape as shown in Figure 3. If the forces F and F' continue to be exerted the hole D disappears by deformation and becomes a slit which prevents the escape of the objects. Thus by a judicious adjustment of the combination of the hole and the slit it is possible to obtain delivery of the objects C one by one. This combination may have any shape, for example star-shape, according to the characteristics of the objects to be delivered.

Of course the dimensions of the partition B, the cutting of the hole D, the elasticity of the material and the size of the objects C have to be coordinated in such a way that the lateral flattening of the tube A does not lead to crushing of the objects C one against the other.

The position of the hole D is not limited to lying in the centre of the partition. More than two slits E or even a single slit may be provided, each particular arrangement being determined by the shape of the objects C.

Again the tube A may be square or rectangular or of any other shape. It will be readily appreciated that the bottom of a tube A of square section, slit laterally through its centre and pressed on opposite sides in the direction of the slit, will open under similar conditions.

Figures 5 and 6 show the application of the above principle to a first embodiment of a dispensing device in accordance with the invention for pills. In these figures G designates a closed cylindrical tube serving as container for the pills. The device comprises an external cover H and the part A is in the form of a cylindrical extension on the cover terminating in the partition B.

Formed integral with the part A is a ladle I into which the pills are discharged from the dispensing device. The partition B is provided with the slit E and the hole D. Figure 6 shows the device in use, the forces F and F' having

flattened the tube A and deformed the opening D, E so that the pills can pass into the ladle I. Removal of the forces F and F' recloses the slit E and the pills may be consumed, without being touched by hand, by using the device as a spoon.

Figures 7 to 10 show a modified form of dispensing device in which the container consists of two telescopic tubes A and G. Figure 7 shows the device closed, Figure 8 shows it open in readiness for use, and Figure 9 shows the detail of the arrangement provided to limit the travel of the tube A so that it cannot become detached from tube G. This last mentioned arrangement comprises a toroidal part J arranged internally of the tube G. This toroidal part has a gentle slope towards the open end of the tube G and also serves to ensure sealing of the device in its closed position in which the part K of the tube A seats against it. The part L of the tube A has a diameter slightly greater than the internal diameter of the part J to provide the required stop.

The introduction of the tube A in the tube G is possible by reason of the elasticity of the members, which are made of supple material, and the slight conicity of the part J towards the exterior. It will be understood that this dispensing device cannot be taken to pieces, but that an arrangement permitting such taking to pieces would not change the principle of the invention in any way.

The dispensing device shown in Figures 7 to 10 again comprises the partition B, the hole D, the slit E and the ladle I.

The dispensing device shown in Figure 11 comprises an external cover designated by the reference letter U. This cover is in the form of a tube of any cross-section carrying a circular constriction J. This constriction J serves as a stop for the telescopic tube A when the latter is pulled to employ the dispensing device.

The tube A is made from supple material and thus can be forced through the constriction J at the time of assembling the device.

The tube A comprises a perforated and deformable partition B and is provided with a receptacle forming a ladle I.

The method of employment is the same as before, but here the tube A alone forms the container for the objects, being closed at one end by a disc T forced into a recess in the internal surface of the end of the tube A. It will be appreciated that as a result of this arrangement the objects (e.g. pills, etc.) contained in the tube A do not come into contact with the external cover U at any instant. This permits simple filling of the device, effected through the rear, and its simple closing by the forcing in of the disc T. It also avoids abrasion of the objects at the time of closing the sliding cover.

Figures 13 to 15 show details of arrange-

ments permitting the delivery of objects one at a time into the ladle.

Figure 13 is a section along the line XIII—XIII of Figure 12, and Figure 14 is a section along the line XIV—XIV of Figure 12. In the lower part of Figure 13, which shows in section the receiving ladle I for the objects, there will be seen in section two bosses V forming between them a central groove W. The bosses extend in front and to the rear of the deformable partition B passing under the latter with a small clearance. The purpose of the groove W is to arrange the objects (usually spherical) in single file. The hole in the partition B in this case is crescent-shaped, as will be seen in Figures 13 and 14, and it is designated with the reference letter X.

Figure 15 shows the front part of the dispensing device in the position of use. The deformable partition B is inclined under the action of lateral pressure on the tube in accordance with what has been described above, and has allowed one object to escape. But this movement of the partition B has blocked the following object in the groove W by the tilting of a finger Y formed integral with the partition B.

Figures 16 and 17 show a dispensing device which can be fitted to the neck of a bottle Z serving as a receptacle for the objects. The cover is composed of two parts of supple material, one of which slides in the other. One part M fixes on to the bottle and comprises an internally cylindrical part in which is placed and slides the part N which forms the dispensing device proper. The latter comprises a receiving ladle I and a deformable partition B as in the case of the device of Figures 11 and 12. When the part N is pushed into the part M the end of the part N forms a fluid-tight cover. When the device is to be used it suffices to pull on the upper end of the part N so that it slides up to the stop O. The upper end of the part M is then pressed and the latter in its turn deforms that portion of the part N which lies at this height. This portion of the part N envelops the deformable partition B in this region. Figure 17 shows the device in the position of use.

Figures 18 to 22 show an automatic dispensing device operating by a simple pulling of the cover.

The tube U (Figure 18) is here shown as being of oval cross-section. It includes a mark (here shown as an arrow P) which may be engraved or formed by any other process, indicating the part which should be uppermost at the time of use. This is to avoid opening of the device while it is held in the wrong position, which would result in the delivered objects falling to the ground.

Figure 19 shows the tube A which carries hollow bosses Q and R intended to receive lateral internal bosses S provided on the tube U.

Figure 20 is a central horizontal section of the device shown in its closed condition. The part of the wall of the tube A situated between the hollow bosses Q and R carries on its inside the deformable partition B.

When the tube A is pulled it slides relative to the outer tube U and the part of the wall situated between Q and R is obliged to pass the constriction formed by the internal bosses S. This movement causes flattening of the cover and deformation of the partition B. As we have seen previously, an object will be liberated and falls into the receiving ladle I. The lateral squeezing operation being effected automatically by pulling the cover. To close the device it is necessary to incline it towards the rear to avoid another object from entering the receiving ladle. If this occurred there would be two objects in the ladle, instead of one, on the occasion of the next opening operation.

This invention is particularly well suited for use with objects of small volume, such as pharmaceutical pills, capsules and granules, confectionery, sweets, etc.

#### WHAT WE CLAIM IS:—

1. A device for dispensing small objects such as pharmaceutical pills comprising an elastically deformable container, an end wall of which is provided with an aperture adapted to be widened by lateral pressure exerted on said container in the vicinity of the said aperture, wherein the said container is provided with a receptacle for receiving the dispensed objects, said receptacle being adjacent to the said end wall and having a laterally disposed opening.

2. A device as claimed in Claim 1, wherein the width of said aperture is slightly smaller than the smallest dimension of the objects to be dispensed when no such pressure is exerted on the container, whereby a slight pressure will be sufficient for widening said aperture in order to enable an object to pass out of the container.

3. A device as claimed in Claim 1, wherein said aperture comprises a circular central hole and slits extending diametrically from said central hole.

4. A device as claimed in Claim 1, wherein said aperture is crescent-shaped.

5. A device as claimed in Claim 4, wherein the said crescent-shaped aperture is adjacent to a lateral wall of the container the said wall being provided with a guiding groove for the objects to be dispensed in front of the central part of the said aperture.

6. A device as claimed in Claim 5, wherein said end wall possesses an inwardly directed finger in front of said guiding groove, said finger being adapted to act as a stop for preventing more than one object from being dispensed when the said lateral pressure is exerted on the container.

7. A device as claimed in any of Claims 1 to 6, wherein the said container and receptacle

are adapted to slide telescopically in a tubular sheath, the outer end of the said receptacle being adapted to serve as a closure member for said sheath.

5 8. A device as claimed in Claim 7, wherein stops are provided for preventing said container from being totally withdrawn from said sheath.

10 9. A device as claimed in Claim 8, wherein the inner end of said container is open.

15 10. A device as claimed in any one of Claims 7 to 9, wherein means are provided on said sheath and container for ensuring the exertion of said lateral pressure on the container when the latter is drawn out of the sheath.

20 11. A device as claimed in Claim 10, wherein said container is provided with an enlarged portion laterally of said end wall and said sheath comprises a portion with a restricted cross-section, these portions being mutually disposed in such a manner that the enlarged

portion has to be passed through the other portion when the container is drawn out of the sheath.

12. A device as claimed in any one of Claims 1 to 6, wherein said container has an open end and is adapted to be removably secured to a bottle or the like containing the objects to be dispensed. 25

13. A device as claimed in any of Claims 1 to 6 and in Claim 12, wherein the said receptacle is adapted to serve as a closure member for the container. 30

14. A device for dispensing small objects constructed and arranged substantially as herein described and as shown in Figures 1 to 4, Figures 5 and 6, Figures 7 to 10, Figures 11 to 15, Figures 16 and 17 or Figures 18 to 22 of the accompanying drawings. 35

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Fig: 1

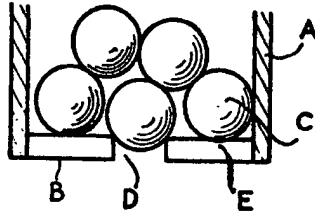


Fig: 3

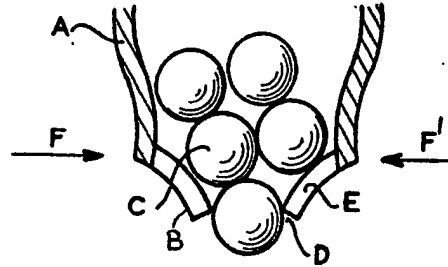


Fig: 2

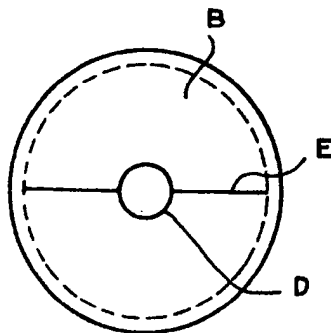


Fig: 4

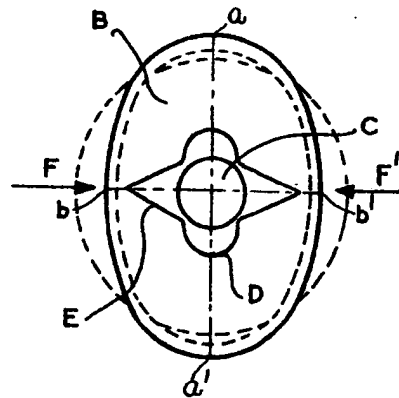


Fig : 5

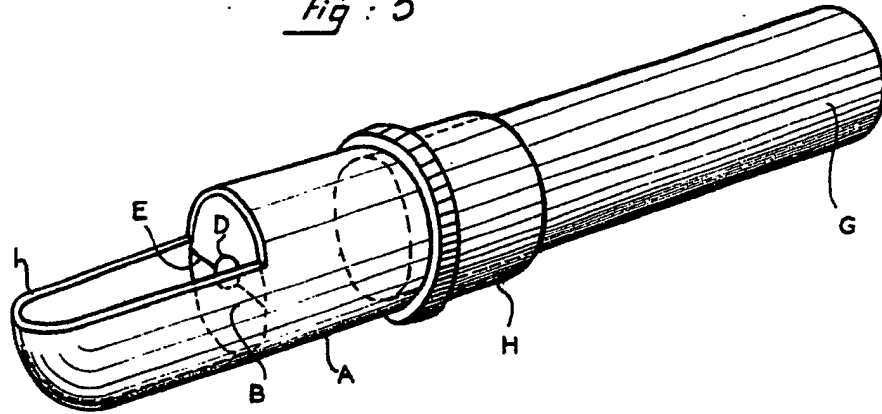


Fig : 6

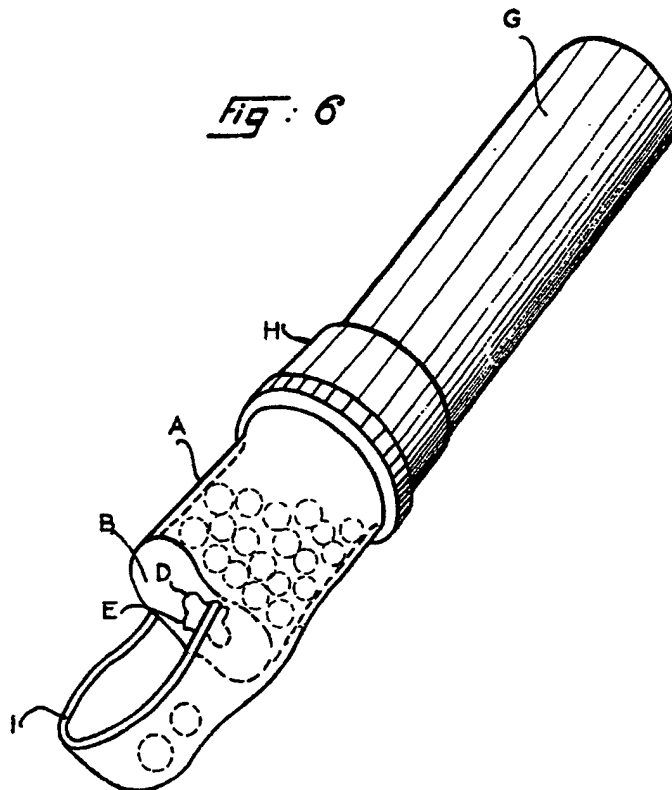


Fig: 7

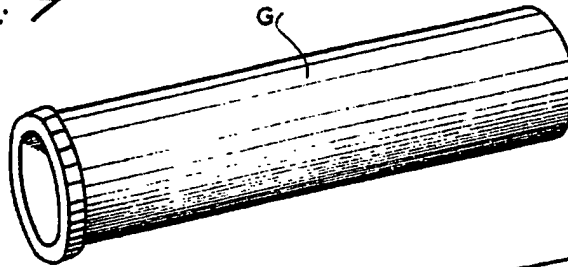


Fig: 8

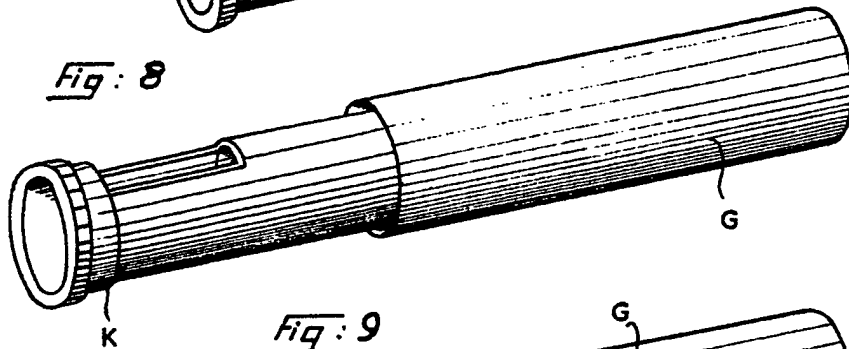


Fig: 9

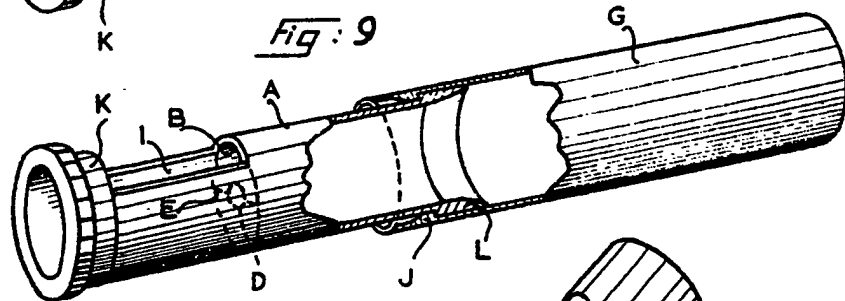
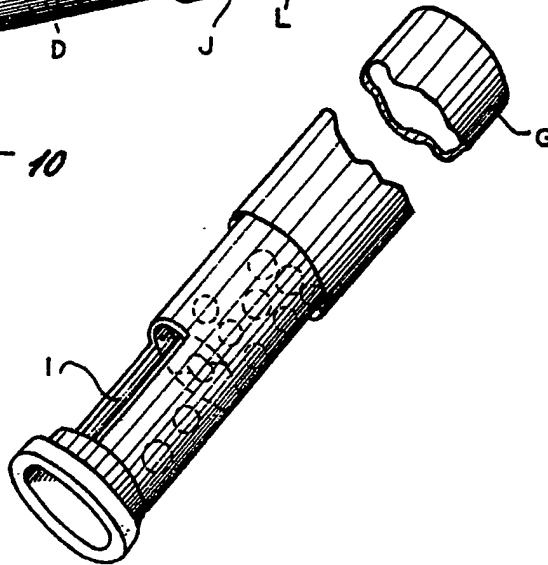


Fig. 10



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 SHEETS 2 & 3

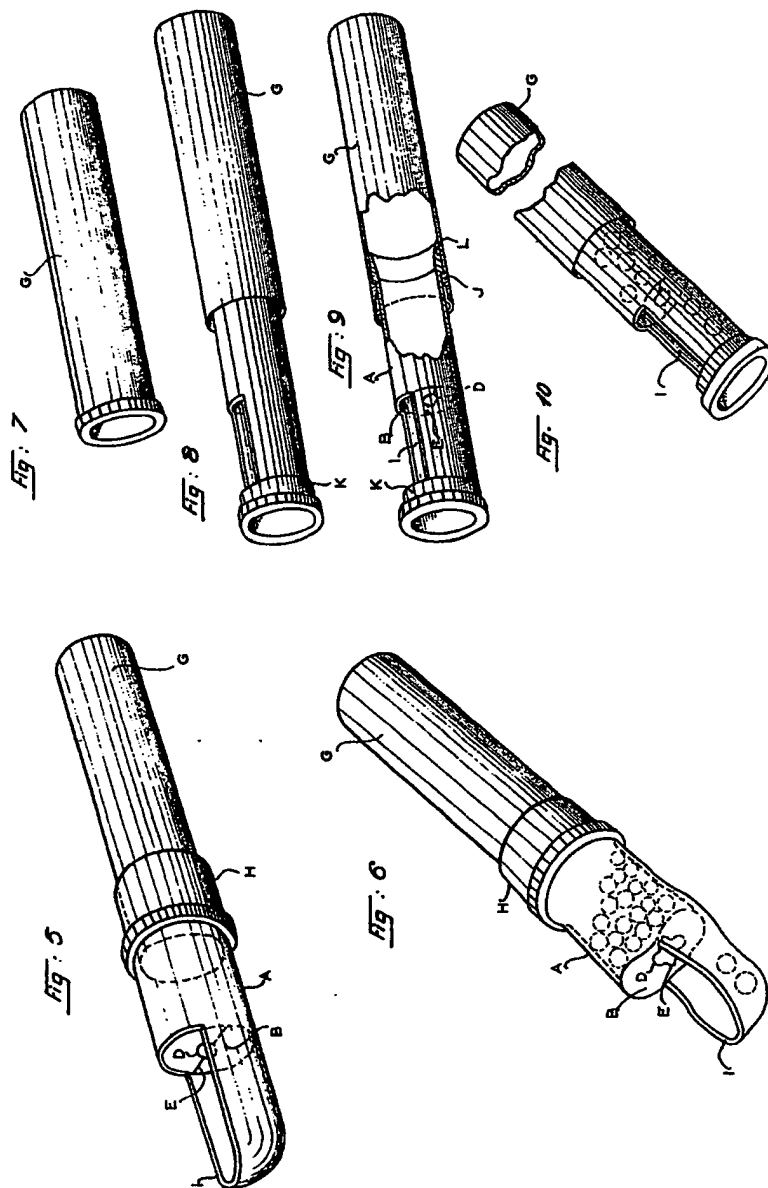




Fig: 11

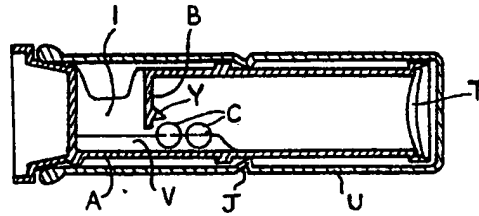


Fig: 12

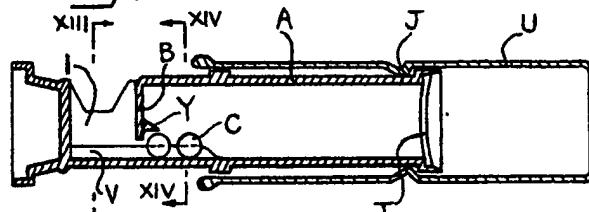


Fig: 13



Fig: 14

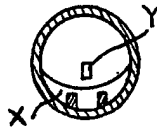


Fig: 15

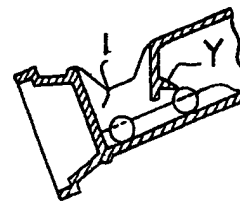


Fig: 16

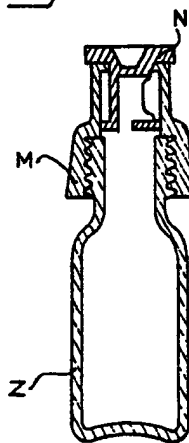
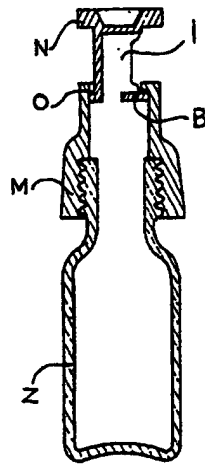


Fig: 17



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Fig: 18

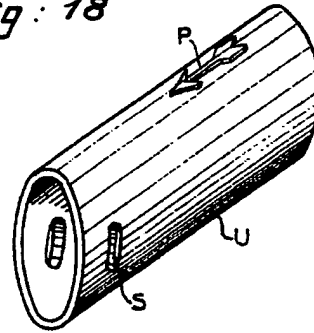


Fig: 19

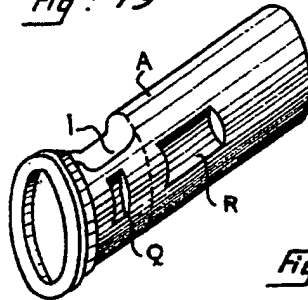


Fig: 20

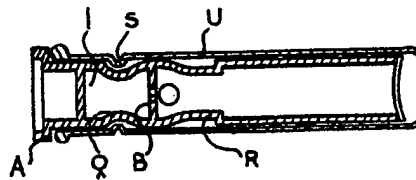


Fig: 21

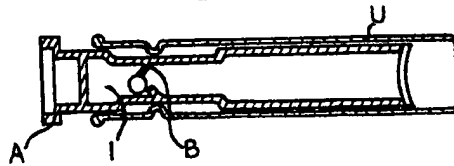
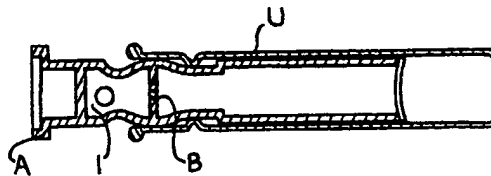


Fig: 22



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 SHEETS 4 & 5

